The Wristwatch: Changing Times

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Introduction

Figure 1: *Zero Hour* **courtesy of the Imperial War Museum**

This painting by the British artist James Prinsep Beadle resides in the Imperial War Museum London.[1] Entitled *Zero Hour* and painted in 1918, it depicts a British officer glancing at his watch to check the time before he leads his men over the trench and into the thick of combat. This action is replete with meaning, it portends the time of attack, and all of the men watching him know that mortal danger is but minutes away. The conditions that led to the creation of significance around such a simple act as a soldier needing to check the time on his wristwatch before he could attack are complex, and they will be examined in this paper.

This thesis stands astride the crossroads of multiple sub-fields of history. Its aim is to trace the impact of the First World War on the conception of time. This is a broad goal.

[1] James Beadle, "Zero Hour," *Art UK* (London), accessed November 23, 2020, https://artuk.org/discover/artworks/zero-hour-6640/search/actor:beadle-james-prinsep-18631947/page/1/view_as/grid.

Accordingly, the thesis has a narrowed in scope to make the case. Since, we must investigate the *changing* nature of time it is vital to examine the experience, practice, and nature of time *prior to* the outbreak of war. The first chapter seeks to lay out a brief treatment of the pre-war time that the populace of the Anglo-American world was familiar with. To do so, I trace trends in business history, the history of science, and that of philosophy. All these varied interests were converging on temporal issues along important axes from the middle of the century right up to the outbreak of the Great War. The aim of the chapter is to lay out what the dominant prewar ideas about time were, and how they were evolving at the turn of the century and in the decades immediately prior to the outbreak of war and the sea change that shortly followed. That sea change is the modern conception of time as we know it. The fact that remarking upon alternative conceptions of time is uncommon testifies to the dominance of the "clock time" hegemony. The world was not always measured at base by the vibrations of a caesium atom, and to neglect the history of time prior to our modern way of understanding temporality would be a grave error.

The second chapter is interested in tracing the development of the wristwatch. This now-ubiquitous object was a rare sight on a man prior to the First World War, primarily being worn by women. I show how pre-war trends such as the increasing role of women in the workplace and the rise of sports prepared the way for a man to set aside his pocket watch and strap on a wristwatch. These trends were fueled by the market and by the increasing recognition of the importance of the wristwatch by soldiers and manufacturers. Furthermore, I examine the role the First World War played in universalizing the experience of wearing a wristwatch in the post-war world.

The third chapter is in a sense a psychological history of the experience of time by soldiers during the First World War. Inspired by Stephen Kern and Eric J. Leed, this chapter

attempts to show how the conditions of wartime created by total war affected everything from strategic planning to the very sense of day and night and altered the regulative function of time in shattering ways. The redefinition of boundaries brought about by the Great War marked affected how soldiers understood time and set the stage for post-war ideas about time.

I conclude this thesis by drawing together the many fields that I have touched upon to restate my case. I raise further questions that lie beyond the scope of this paper and I reiterate the importance of this work based upon the strength of its interdisciplinarity. I find this topic to be fascinating and revealing on multiple levels, as it touches so many fields while remaining distinctively itself.

Chapter One

David. S. Landes writes in his seminal work *Revolution In Time* that "In a timekeeping society, we are all linked by habit and mind-set to the standard of measurement…"[2] That we live in such a society today is the result of a multivocal process that encompasses varied efforts in the commercial, scientific, and philosophic spheres, all of which converged in the final twenty years of the 19th and the first decade of the 20th century.

The modern concept and widespread awareness of time is a recent development in human history, one driven by the economic and social changes of the 19th century. As the Industrial Revolution progressed and commerce between distant places grew, more precise means of measure from everything from distance to weight were required. It is impossible to separate the standardization of time from these parallel efforts to ease communication and engender uniformity. Not only commerce, but the ever more precise science of navigation required accurate timekeeping for its improvement. The transformation from a society in which clocks were luxury marvels to one where every man had one on his wrist was an immense shift, one that led to a sea change in the pacing of life for millions. The modern mind struggles to envision a world ungoverned by time. We are surrounded by displays of the time in every corner of the screens that occupy so much of our daily attention. That change was slow and replaced myriad former ways of measuring and thinking about time. The triumph of "clock time" was the result of a long process, driven by advances in varied fields that have become enmeshed in such a way that they compose our modern sensation of time. Stefan Zweig, an Austrian man of letters wrote of the 19th century in his autobiography that "For it was not a century of suffering in which I was

[2] David S. Landes, *Revolution in Time* (Cambridge, MA: Harvard University, 1983), 30.

born and educated. It was an ordered world with definite classes and calm transitions, a world without haste. The rhythm of the new speed had not yet carried over from the machines, the automobile, the telephone, the radio, and the airplane, to mankind; time and age had another measure."[3]

Shortly after Zweig's birth in 1881, the International Meridian Conference was organized in Washington, D.C. and set about changing that tranquil world forever. This conference, building on the efforts of previous assemblies such as the First International Geographical Congress in 1871, the Second IGC in Rome in 1875, and the Seventh IGC in 1883, established the Prime Meridian as "…the meridian passing through the centre of the transit instrument at the Observatory of Greenwich..."[4] Representatives from 41 nations arrived at this decision based on two practical criteria. The first was that the Meridian had to pass through an observatory equipped with the finest instruments of the day. The second was based on the fact that at the time 72% of all of the commercial tonnage then afloat already used the Greenwich Meridian.[5] In establishing a universal meridian at 0 degrees, the representatives not only achieved their objectives of preventing confusion and easing the flow of commerce but initiated a larger societal change.

By basing all time zones off of the time at Greenwich, the world moved closer together, this was but one of the many steps taken to knit together the systems that nation states were developing and deploying to aid the administration of empire and the flow of commerce. As

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[3] Stefan Zweig, *The World of Yesterday* (New York, NY: The Viking Press, 1943), 30. https://www.fadedpage.com/showbook.php?pid=20181225.
[4] Various. *The Project Gutenberg eBook of International Conference Held at Washington for the Purpose of Fixing a Prime Meridian and a Universal Day. https://www.gutenberg.org/.* Washington, D.C.: Gibson Bros., Printers and Bookbinders, 1884, 200. https://www.gutenberg.org/files/17759/17759-h/17759-h.htm.
[5] Ibid, 78.

longitude was calculated based on the *time* as well as the location of Greenwich, the stage was set for a reorganization of temporal boundaries. This temporal shift inexorably crossed national borders, though some countries such as France attempted to maintain a kind of national pride in their own time with clever innovations. France based it's time off of the observatory in Paris, though it was retrograded by nine minutes and twenty-one seconds, precisely the same as Greenwich Mean Time.[6] This international agreement was a vital step in the unification of timekeeping and the dominance of "clock time" in modern life.

But what is clock time?[7] This may appear to be an easily answered question, as the modern conception of time is almost wholly equated with "clock time". At the turn of the century, this was not yet the case. As Alexis McCrossen tells us, ""timetables and schedules were estimations, rather than absolutes; mechanical time (clock time) had not yet penetrated people's consciousness to an extent that made it necessary to check the time instantly or repeatedly; and indeed, abundant signals like bells and whistles forestalled the need for a thorough internalization of clock time."[8] While time zones and pocket watches had been instituted and become commonplace in the late 19th century, the pace of daily life was not yet regulated in the modern sense. That high degree of regulation is characteristic of "clock time". The maturation of new modes of transportation such as railroads and the birth of even newer inventions such as the automobile and the airplane invigorated the populace with a new awareness of speed.[9] Distances became ever more readily closed via rail travel or other means of

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[6] Stephen Kern, *The Culture of Time and Space: 1880-1918* (Cambridge, MA: Harvard University Press, 2003), 13.
[7] Vanessa Ogle, *The Global Transformation of Time: 1870-1950* (Cambridge, MA: Harvard University Press, 2015), 47-48.
[8] Alexis McCrossen, *Marking Modern Times: a History of Clocks, Watches, and Other Timekeepers in American Life* (Chicago: The University of Chicago Press, 2016), 97-98.
[9] Wolfgang Schivelbusch, "Railroad Space and Railroad Time," *New German Critique*, no. 14 (1978), 31-40. https://doi.org/10.2307/488059.

modern communication such as telephone or telegraph. The magnitude of this shift is aptly expressed in *Railroad Space and Railroad Time* ". "The average traveling speed of the early railways in England is 20 to 30 miles an hour, which is roughly three times the speed previously achieved by stagecoaches. Thus, any given distance is covered in one-third of the customary time: temporally that distance shrinks to one-third of its former length"" All travel and communication were regulated by the modern and standardized "clock time" that was growing ever more omnipresent. That most modern of inventions, the timetable, would be the key to the war plans of the warring powers in the summer of 1914. By governing all of the movements of their forces, from mobilization to arrival upon the battlefield, with utmost precision the powers calculated the optimum way to deliver a knockout blow against their foes. Speed was the experienced corollary to the regulation of time and its diffusion into the patterns of life. This newfound sense of urgency would take a deadly toll in the late summer as they rushed headlong into a stalemate.

Multiple categories of society were interested in regulating time. We have briefly mentioned the commercial benefits accrued by shipping and the ease of travel that time zones enabled for railroads, but other stakeholders were involved. Foremost among them were scientific interests. Indeed, the sciences played a vital role in establishing the technical basis that would lead to the establishment of "…coordination of all activity according to a single public time…"[10] and which would have during the First World War "reversed the dominant cultural thrust of the prewar years that explored the multiplicity of private times."[11] One of the ways in which the sciences did this was by pioneering time-distribution systems via telegraph. Indeed,

[10] Kern, 288
[11] Ibid.

this technology was primarily used by the "for the U.S. Coast Survey on longitude expeditions"[12] and that association with longitude echoed the development of the marine chronometer, key for both military and commercial use. The development of the institutions and technical basis for time distribution in American life mirrored the public's growing interest in speed as the inventions of modern life transformed society. This cultural shift was accompanied by a tightening of "The bond between clocks and capitalism…strengthened during the 19th century, as time became an important factor in the quickening pace of commerce and industry."[13] Time was at the nexus of a multivocal array of industries and interests and the story of the triumph of "clock time" is interlinked with the history of commerce, technology and science.

While it may seem that America was the country most interested in matters of time unification and distribution, this was not entirely the case. Certainly, America had the greatest need for such practices developing smoothly due to its vast geographic scale and the requirement for different time zones.[14] It is fair however to say that the Anglo-American world more generally was concerned with time and its accompanying attributes such as speed. The clock could not be separated from the growth of rail travel, and the great efforts to unify time for commercial and scientific benefit captured the public imagination. Even before the Prime Meridian was fixed, novelists such as the celebrated Jules Verne had taken up the importance of time and speed in such books as his 1872 novel *Around the World in 80 Days.* The book is an exemplar of the connection between time, the fixation of the public imagination, and the growth of the actual transportation infrastructure that enabled the world to tie itself to the clock.

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[12] Carlene Stephens, "'The Most Reliable Time': William Bond, the New England Railroads, and Time Awareness in 19th-Century America," *Technology and Culture* 30, no. 1 (1989), 12. https://doi.org/10.2307/3105429.
[13] Ibid, 24.
[14] Eviatar Zerubavel, "The Standardization of Time: A Sociohistorical Perspective," *American Journal of Sociology* 88, no. 1 (1982), 8. http://www.jstor.org/stable/2779401

The triumph of "clock time" was hastened by debates about what precisely time was and how it functioned among physicists and philosophers. Of the former, the most important is Albert Einstein, who published his celebrated theory of relativity in 1915, this theory unified the classically separated concepts of space and time into one continuum. The latter was represented by Henri Bergson, a towering figure of this period and a champion of a view of time that was based on his concept of "duration". This concept is complex and is worthy of mention due to its centrality in Bergson's thought and it's incoherence with the theory of relativity. This incoherence among learned men foreshadowed the strangeness of the temporal experience that would mark the First World War. Duration, that idea of deeply interwoven and simultaneous personal experiences and memories, was inapplicable to the public time that governed the frontlines. There was little time for reflection or examination. Popular conceptions of time struggled to cohere with the changing patterns of life, in anticipation of the far greater collapse brought about by the war.

In Paris on the 6th of April 1922 Albert Einstein and Henri Bergson met at a meeting of *Société française de philosophie*. Einstein, still at the dawn of his career and having not yet achieved the meteoric heights of fame he would accrue in later years, provided an account of time that sought to divorce human perception from the concept. In his remarks he emphasized the objective nature of time and directly attacked the propositions about time that Bergson had laid out his entire career stating "the time of the philosopher does not exist"[15]. That provocative statement led Bergson to pen his 1922 work *Durée et simultanéité* (Duration and simultaneity) in which he lays out his objections to the purely physical time that Einstein proposed. This

[15] Jimena Canales, *The Physicist & the Philosopher: Einstein, Bergson, and the Debate That Changed Our Understanding of Time* (Princeton, NJ: Princeton University Press, 2017), 20.

distinction between the "physical" time of Einstein and the "psychological" time or "duration" of Bergson is worth exploring. The transition between these dominant understandings of time occurred at the same historical moment that patterns of consumption were changing and wristwatches were replacing pocket watches, becoming a greater presence in the lives of millions as the new century progressed.

Jimena Canales does much to elucidate the differing conceptions of time that were warring at the dawn of the 20th century. Though pocket watches and clocks in people's homes had been common for decades, the modern concept of time had not yet blossomed into the objective reality visualized by an arrow that we think of today. Bergson's conception of time placed the emphasis on, in Einstein's terms "psychological time". This dual view of time as being described in one way by clocks and in another by one's experience is at the root of the debate between the two men. Bergson insisted on the existence of a multiplicity of times, all of which could be considered "real". Einstein reduced all time to a singular, universal concept, one integrated with space. This debate was reflected in the literature of the era.

Kafka, Proust and other literary figures adopted Bergson's conception of time. Kafka highlighted the distinction, noting that "The clocks don't agree. The inner one rushes along in a devilish or demonic-–in any case, inhuman—way while the outer one goes, falteringly its accustomed pace."[16] Bergson married one of Proust's cousins, and his influence, while not strong enough to draw a direct relationship between the two men, is certainly noticeable in Proust's work. This connection is demonstrated in Proust's magnum opus, *In Search of Lost Time*. The temporal shifts that Proust makes and their narrative effects are in keeping with a Bergsonian

[16] Franz Kafka, *Tagebücher 1910-23* (Frankfurt: 1951), 552.

conception of time. A literary analysis of the final section of his book reveals that Proust categorizes the war as a public event that "turn[s]" the writer away from the 'interior book of unknown symbols'"[17] namely the private time that had so long been the dominant form of temporal experience in the world.

Female writers also explored the distinction between the physical "clock time" of Einstein and the psychological "duration" of Bergson. Virginia Woolf in her 1925 novel *Mrs. Dalloway* states of the titular character:

> For having lived in Westminster – how many years now? over twenty – one feels even in the midst of the traffic, or waking at night, Clarissa was positive, a particular hush, or solemnity; an indescribable pause; a suspense (but that might be her heart, affected, they said, by influenza) before Big Ben strikes. There! Out it boomed. First a warning, musical; then the hour, irrevocable. The leaden circles dissolved in the air.[18]

The tension between Clarissa's thoughts and the striking of the clock is eloquently explored by Matthew Taunton in his article *Modernism, Time and Consciousness: the Influence of Henri Bergson and Marcel Proust*. Taunton tells us that the passage above is notable because its main event is actually the striking of the clock rather than the thoughts of the main character.[19] This exploration of time as more than simply an experienced flow was far from unusual in the literature of the period. Taunton gives examples from T.S. Eliot and describes how Bergson's ideas, while influential, did not pervade upon modernist literature in a wholly positive manner. He states that Percy Wyndham Lewis in his novel *Time and Western Man* describes Bergson's conception of time "… solipsistically individualistic and anti-political, revelling in individual

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[17] Julia Kristeva, *Time and Sense: Proust and the Experience of Literature* (New York: Columbia University Press, 1998), 144.
[18] Virginia Woolf, *Mrs. Dalloway* (Oxford: Oxford University Press, 2000), 3–4.
[19] Matthew Taunton, "Modernism, Time and Consciousness: the Influence of Henri Bergson and Marcel Proust," British Library, May 25, 2016, 1. https://www.bl.uk/20th-century-literature/articles/modernism-time-and-consciousness-the-influence-of-henri-bergson-and-marcel-proust.

sensory experience and memory to the extent that social and historical reality was spurned."[20] These examples show the vast reach that Bergson's philosophy and his view on time had at the height of his powers. The literature of a given period is revealing in that even, or perhaps especially, fiction captures the thoughts of the author on a given topic. That Bergson's ideas were present in the writings of the day mark the high tide of his influence and make the subsequent decline of his conception all the more striking.

The key event that catalyzed the decline of the private "psychological times" of the 19th century espoused by Bergson was the First World War. While older conceptions of time would persist past its bloody conclusion, the world and its sense of time were forever altered by the events of 1914-1918. The changing of time affected families on the Homefront, soldiers on the battlefield and every manner of person in between. The mass unification of time and the shattering effects of disintegrating boundaries, of the battlefield, of class, even of day and night altered the prewar conception in fundamental and irreversible ways. The war demanded mass coordination as a condition of victory, but on a granular level, it fragmented temporal experiences in unprecedented ways. This change affected the very form of watches themselves, whereas previously a man experienced time thusly: "With the watch face covered, attending to the time was a deliberate, even ritualistic, act: a man would reach into his pocket, pull out the watch, open the case, read the time. Since he could not leave it dangling by the chain once he ascertained the time, he then had to close the case and return the watch to its pocket."[21] The First World War would decisively end that manner of experiencing the time. It would bring about an

[20] Ibid.
[21] Alexis McCrossen, *Marking Modern Times: a History of Clocks, Watches, and Other Timekeepers in American Life* (Chicago: The University of Chicago Press, 2016), 97.

era in which the precise time was a matter of life and death and needed to be available at a glance. To pause was to put oneself in peril.

That the modern era is characterized by a coordinated network of clocks that dictate the time to the individual is a fact of life. Every glance at a computer screen or phone reflects the same time, adjusted according to the time zone that one is physically located in. This represents the triumph of Einsteinian time, one accelerated by the ripple effects of the First World War. While Bergson could accede to the practical benefits of such networks, he would stand aghast at the lack of personal *meaning* the time has at present.. As soldiers returned home with watches on their wrists the time became available at a glance. The shift from the locally regulated public time of the 19th century and its space for "psychological time" gave way to the "clock time" of the 20th. One of the phenomenological factors that enabled this shift was the proliferation of timepieces brought about by the First World War. Massive social change, coupled with the triumph of the Einsteinian temporal view, and the converging interests of many aspects of society birthed modern time.

Chapter Two

In Chapter One, we discussed the conceptual development that led to the dialectical conception of time that permeated society at the turn of the century. This chapter shall primarily be focused on how the First World War created the trench watch as a discrete item. In doing so, the war accelerated trends that had been in motion for some time prior to its outbreak such as the entry of women into the workplace in great numbers, and the growth of sports as a result of the middle classes having increased leisure time. Tracing this development is key to integrating the story of the Great War into thew overall change that was occurring and demonstrating its role as an accelerant for that change by redefining the parameters of social mores and consumer habits.

Amy K. Glasmeier writes in her book *Manufacturing Time: Global Competition in the Watch Industry 1795-2000* that there were three primary reasons for the widespread adoption of the wristwatch by the public prior to the outbreak of the First World War. Two of those reasons are germane to the purposes of this paper.

> First, wristwatches were ideal for women, particularly those entering the workforce. Early watch models designed for women were usually just smaller versions of men's pocket watches. The wristwatch, on the other hand, afforded women a greater choice of styles and exterior qualities. Second, the wristwatch suited those interested in sports and bicycling, which both called for a timekeeper that did not have to be pulled out of a pocket, opened, and read.[27]

Glasmeier's passage notes that the adoption of the wristwatch was one of a multitude of changes that were occurring at the turn of the century across myriad domains. The conceptual shift in society's collective imagination of time was mirrored in the consumer trends and new habits of the population.

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[27] Amy Glasmeier, *Manufacturing Time: Global Competition in the Watch Industry, 1795-2000* (New York, NY: Guilford Press, 2000), 142.

Glasmeier's claim that the wristwatch was marketed and envisioned as a distinctly feminine product is corroborated by a 1912 article in the *New York Times* which states that "It is probably because this new bit of jewelry is helpful that it became universally fashionable. It is worn over here by women who have to work as well as those who play, and by women who have to pay for their own as well as by those who have jewelry given to them."[28] Whereas in previous iterations, wear of a watch by a women had served primarily ornamental ends, the newfound occasion of women in the workplace had changed the form of the product to emphasize function. The shift from an item strongly identified with the jewelry category to one that became a necessary part of attire due to its functional attributes is telling. That the war served to accelerate the gender dynamics of the workplace to include women is evident. Post-war, the wristwatch was seen as a required article regardless of gender, a testament to its functionality.

Her second claim about the growth of sports and interest in exercise is also worthy of examination. This trend was enabled by the growth of leisure brought about by the second phase of the Industrial Revolution. People were able to occupy their time with exercise and the pursuit of physical fitness became a virtue. This was a transatlantic pursuit, one dating back to at least 1899, when Theodore Roosevelt, then the Governor of New York gave his famous speech "The Strenuous Life". From its modern inception, sport was tied to the military. In Britain, the apocryphal statement by Lord Wellington "The Battle of Waterloo was won on the playing fields of Eton" defined "the dominant assumption in British imperial ideology, namely that sporting practices can contribute massively to masculine military pedagogy."[29] As the majority of officers in the British Army were pulled from public schools, they would have been familiar with this

[28] "Cartier's New Bracelet." The New York Times, October 6, 1912. https://timesmachine.nytimes.com/timesmachine/1912/10/06/100378723.html?pageNumber=45.
[29] Richard Giulianotti and Gary Armstrong. "Sport, the Military and Peacemaking: History and Possibilities." *Third World Quarterly* 32, no. 3 (2011), 379-94. Accessed November 13, 2020. http://www.jstor.org/stable/41300316.

culture of physical fitness, and on the frontline they would have worn their watches while at play. These pre-war ideas about the role of sports continued unabated over the course of the First World War as soldiers were constantly engaged in games during leave.

As the war continued, soldiers began to develop best practices for weapons and equipment. This phenomenon is exemplified in the aptly titled 1916 pamphlet *Knowledge for War, Every Officer's Handbook for the Front*. Penned by Captain B.C. Lake of the King's Own Scottish Borderer's it lists "Officer's Kit for the Front"; tellingly, the first item listed is "Luminous wrist watch with unbreakable glass."[30] While the need for a wristwatch may have initially been seen as being a primarily officer-oriented requirement, over the course of the war this shifted toward universality. Indeed, a wristwatch was not generally issued to a soldier, particularly an officer. In keeping with the tradition of British Army officers being gentlemen, the expectation was that they would provide their gear themselves.[31]

Nevertheless, despite the cost of a wristwatch being among the highest a soldier would pay for a piece of gear on the front, a 1916 meeting of clock manufacturer H. Williamson Ltd. stated that:

> The public is buying the practical things of life. Nobody can truthfully contend that the watch is a luxury. In these days the watch is as necessary as a hat - more so, in fact. One can catch trains and keep appointments without a hat, but not without a watch. It is said that one soldier in every four wears a wristlet watch, and the other three mean to get one as soon as they can. Wristlet watches are not luxuries; wedding-rings are not luxuries. These are the two items jewellers have been selling in the greatest quantities for many months past.[32]

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[30] B.C. Lake, *Knowledge for War, Every Officer's Handbook for the Front* (London: Harrison and Sons, 1916), https://archive.org/details/knowledgeforware00lakerich/page/n17/mode/2up?q=watch. 177

[31] David Boettcher, "Knowledge for War," Vintage Watchstraps, 2020, https://www.vintagewatchstraps.com/trenchwatches.php.

[32] David Boettcher, "Wristwatches in the Great War," Vintage Watchstraps, 2020, https://www.vintagewatchstraps.com/trenchwatches.php.

This passage is extremely telling in what it reveals about the frame of mind of a key and little studied group: watch manufacturers. They recognized the importance of the watch on the modern battlefield so much so that they equate it with a wedding ring in value. Furthermore, they welcomed the shift of the wristwatch from a lady's wristlet to a vital piece of soldiers' kit. No doubt this was good for sales, the pages of the American paper *Stars and Stripes* as well as the *London Times* are filled with watch advertisements, as seen in Figure 2.[33] The watch pictured is particularly notable in that it comes affixed with a grill for protection on the front. Some early designs will be discussed below, but the figure shows that the maturation of the trench watch as a distinctive item born of the front was complete by 1918. That the shift was recognized among the group that manufactured watches is vital and is but one of the sea changes that the war engendered in society.

Figure 2: Wristwatch advertisement (red highlight mine)

As the adoption of watches by soldiers of all ranks became ever more widespread, the form of the wristwatch changed to accommodate the needs of the battlefield. While the wristwatch and the pocket watch share many of the same mechanical principles, the differences in wear between them necessitated a change in the degree of protection provided to the movement. Many pocket watches used hunter cases, these cases closed over the watch face and protected it from scratches, dust, and other forms of harm incidental to daily life. A hunter case

[33] "Advertisement," *Stars and Stripes*, 1916, https://www.loc.gov/item/20001931/1918-12-06/ed- 1/.

on a wristwatch defeats the purpose of having the time easily accessible at a glance. As modern forms of shock protection using a spring to give the movement some protection would not come to fruition until 1934 with the invention of the Incabloc shock protection system[34]; most of the improvements in hardiness for the wristwatch were focused on making better crystal faces or on devising a metal contraption that would protect the crystal and still preserve readability.

Dr. Anthony Mills and Mr. Mark Mills in their article *The Invention of the War Machine: Science, Technology, and the First World War* propose that the common view of the First World War as a battle of modern science, of engineering, of accrued chemical and mechanical advantages developed to make the enemy arsenal ineffective is slightly misplaced. They see "Wartime" and its accompanying demands on existing technologies and organizational structures as serving primarily as a *catalyst*. They write that *"*the needs of warfare made advancement or modification urgent, while the magnitude of demand stimulated industrial-scale production."[35] This focus on the production of material was spurred by the exigent conditions demanded by "Wartime". In order to achieve the goals set forth by the state, a re-imagination of the place of science and its process was required. While governments procured limited numbers of watches for soldiers who had need of them such as aviators, the vast majority of the watches on the Western Front were purchased from private manufacturers.

Indeed, the history of the aviation watch is an important component of the development of the wristwatch more generally. Louis Cartier, the French jeweler who would design the "Tank" watch was acquainted with the aviation pioneer Alberto Santos Dumont. When Dumont

[34] David Boettcher, "Incabloc," Vintage Watchstraps, 2015, https://www.vintagewatchstraps.com/blogantishock.php.
[35] M. Anthony Mills and Mark P. Mills, "The Invention of the War Machine," *The New Atlantis*, no. 42 (2014), 9. http://www.jstor.org.proxy.lib.ohio-state.edu/stable/43152788.

complained about the difficulty of using a pocket watch in flight, Cartier designed the first pilot watch. This watch was revolutionary is design as well as function as it "The new watch model featured lugs that were integrated into the case to accommodate a strap, a concept that paved the way for the modern wristwatches of today."[36] Aviators needed an accurate watch in order to make "…speed, distance and fuel calculations"[37] while in flight. As a pocket watch required one to remove one's hands from the controls and was generally not designed to be easily read at a glance, aviation watches developed as their own distinctive subcategory of wristwatch. The British Royal Flying Corps issued pocket watches to pilots that were designed to be fitted into an instrument holder on the panel of the aircraft. These "cockpit watches" functioned in an equivalent manner to a car's dashboard clock. While use as "cockpit watches" may have been the intention of the RFC, in another example of adaptation by soldiers, many British pilots wore their watches as wristwatches.

The wristwatch, along with many other kinds of gear, was subject to adaptation and improvement as soldiers became familiarized with the demands of trench warfare. Just as new weapons and equipment demanded innovation of new tactics, so too did the conditions of the modern battlefield demand a reevaluation of pre-existing gear. A simple change like sharpening the edge of an issued piece of gear such as a shovel gave a soldier a handy weapon for the close-quarters combat of trench raiding where his bayonet was ineffective. With regards to wristwatches, two patent applications, one from Britain, one from Canada, provide examples of what designers were thinking in this period.

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[36] "About Santos," Cartier (https://www.cartier.com/en-us/collections/watches/mens-watches/santos-de-cartier/santos-de-cartier.html, n.d.), accessed November 23, 2020.
[37] Bill Bailey, "THE HISTORY OF AVIATION WATCHES (Bremont Watch Company (US), June 2, 2017, https://us.bremont.com/blogs/blogbook/the-history-of-aviation-watches.

The first patent application was filed on the 17th of January 1916 by an Englishman named Harry Daw. Daw's device, as described in the patent application, was meant to work "after the manner of the laths of a Venetian blind, so that by tilting the watch a view of the dial and hands is obtained."[38] The idea was that a soldier could glance at his wrist and see the time at an angle, and then close the "blinds" when heading into combat to ensure the watch was protected. This novel system demonstrates the need to both have the time as a glance and protect the face of the watch. Unfortunately, the use of the other hand required to open or close the "blinds" made it less useful than a cursory evaluation would suggest.

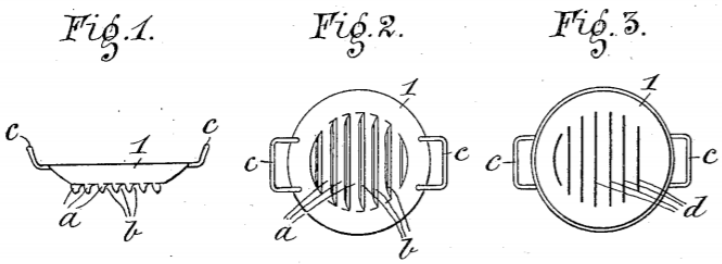

Figure 3: Drawings of Daw's mechanism

[38] Harry Daw. Protector For Wrist Watches, issued December 11, 1917.

The second patent of note was submitted by a Canadian, Frank Farr, on the 3rd of February 1916. He devised a telescoping system, conceptually similar to Harry Daw's design but differing in execution. A notable feature of Farr's proposal is his claim that the design would protect from "breakage under all ordinary circumstances, and which may be used to protect the hands of the watch in the event of the crystal being broken, *so that use of the watch may be continued until it is convenient to secure a new crystal*.[emphasis added]"[39] The italicized sentence provides evidence that watch designers had the battlefield in mind when they were conceptualizing designs. A soldier whose crystal broke in combat could continue to use Farr's watch until an opportunity for replacement availed itself to him.

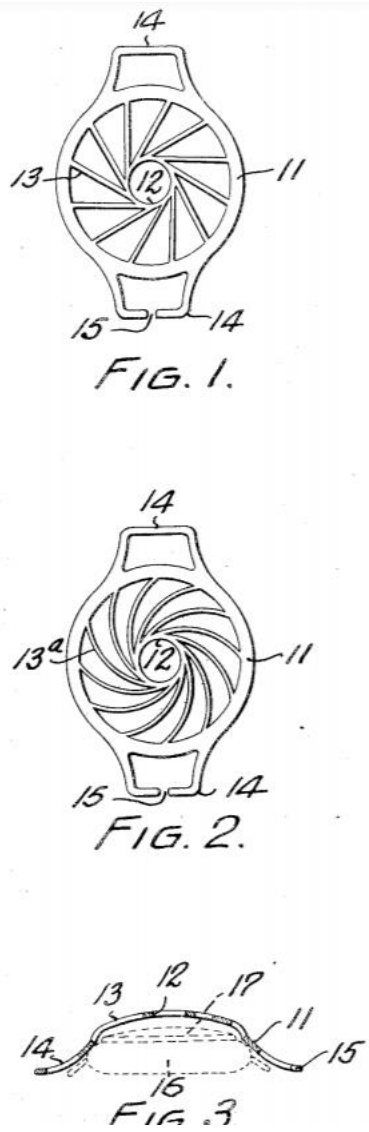

Figure 4: Drawings of Farr's mechanism

One of the important differentiating qualities of a civilian watch of the era and a trench wristwatch is the latter's possession of "unbreakable glass". This was a prominent feature in the advertising of the day along with a luminous dial. Both of these features made use of the latest chemical advances of the day. While celluloid had been a well-known compound since the middle of the nineteenth century, its use in watch crystals was innovative and became widespread as it was more durable than the fragile glass used initially.[40] The second main selling point, the luminous dial, used the then relatively recently discovered element radium to make the hands visible at

[39] Frank Farr. Watch Face Protector., issued September 26, 1916.
[40] David Boettcher, "Unbreakable Glass," Great War Trench Watches, 2020, https://www.vintagewatchstraps.com/trenchwatches.php.

night. The need for a luminous dial increased over the course of the war as “trench raiding”, small scale night attacks by groups of men armed for brutal close quarters combat became a more refined tactic.

Despite the move from an object akin to ornamental jewelry to one defined by functionality, the wristwatch was not stripped of sentimental value. Robert Hale was a Canadian artilleryman who enlisted on 8 February 1915.[41] He and his then girlfriend, later wife, Alice, corresponded frequently from 1915 to 1917. Their letters reveal some of the social associations surrounding wristwatches that were prevalent at the time. As women were the primary wearers of wrist watches or “wristlets” as they were then called, Robert took Alice’s watch with him when he went overseas rather than his pocket watch. This watch was for him not only a practical tool for the battlefield, but also an object bearing deep sentimentality. Hale strongly associated the timepiece with his girlfriend, writing on 19 February 1915 “Although I cannot see you now, I look at your watch and think I can see you. Please don't think that because I have left you that I have finished with you. I love you now more than I ever did.”[42] That Robert took Alice’s watch shows that the North American wristwatch market for men was still in its infancy in 1915.

Indeed, Hale writes in a separate letter dated 13 March 1915 that “Your watch is invaluable to me here. There are only three of us carrying them.”[43] We have discussed how for enlisted men early in the war the wristwatch was not yet the object of nigh universal necessity that it would evolve into. That the watch was both a tool and an object of personal meaning is reflected in the number of trench watches with engraved names, unit affiliations, and other

[41] Robert Hale, “Attestation Paper,” Attestation Paper § (1915).
[42] Robert Hale (Halifax, n.d.).
[43] Robert Hale, accessed November 14, 2020, https://www.canadianletters.ca/content/document-1510?position=17&list=BSX7klFmboaAaiIE2EsqBS77gRKwoXjeV6TY3juemHc.

personal emblems. Just as identity disks were often personalized, trench watches were often engraved with the owner's name, medals he may have won, or if given as a gift the giver and recipient information. A prime example of these engraved watches is Figure 5, soldiers engraved these watches to thwart the namelessness that the war caused.[44] By engraving a watch, identity disk or other small objects they participated in a rehumanizing process, reclaiming a sense of personal identity and personal time from the vast forces that stripped and semblance of individuality from them. This process served both organizational and extremely practical goals. In the first instance, having matching unit watches fostered esprit de corps. In the second, it helped to identify the remains of a soldier killed in action, as the nature of the battlefield often left few remains that could be recovered due to artillery fire.

Three cases testify to the importance of the wristwatch as an object of sentimentality. The Australian War memorial has a robust collection of objects from the military conflicts of its country. Among them are two wristwatches.

Figure 5: Engraved Trench Watch

The first watch was presented to Private R.B. Cameron of the 25th Battalion of the Australian Imperial Force when he enlisted. As we have seen before, watches were gifted to soldiers on numerous special occasions. In this instance, Private Cameron's watch was given to him by his mother and brothers, as the pictured engraving (Figure 6) shows. Private Cameron was killed on 10 June 1918 and his watch was given to a friend and

[44] Ian Haynes, *Superb WW1 Trench Watch with Rifle Brigade Inscription*, photograph, *WW1 Trench Watches*, accessed November 14, 2020, https://www.ww1trenchwatch.com/store/p72/Superb_WW1_Trench_Watch_with_Rifle_Brigade_Inscription.html#.

subsequently lost in the fog of war. That this watch was important to his mother is reinforced by the fact that she wrote to inquire about it in October of 1920. Happily, the watch was returned to Private Cameron's family in 1954 by an Israeli farmer who had acquired it from an Austrian.[45]

Figure 6: Private Cameron's Watch

In the second case, Private Fleming was gifted a watch on the occasion of his enlistment by the residents of his town, Elphinstone, Victoria. This watch was also finely engraved, as seen in Figure 7. He managed to survive the war, despite numerous ailments that sidelined him, returning home as a decorated lance corporal after seeing combat with the 57th Battalion of the AIF in major engagements of 1917 and 18.[46]

Figure 7: Private Fleming's Watch

Finally, a true trench watch possessed by Private A. M. Nicholson of the 5th Battalion of the AIF is marked by a mesh grill to protect the face of the watch. It was damaged, presumably when he was hit by shrapnel on 21 September 1917. He later died of his wounds and was buried in Belgium. The watch is missing its glass and was one of the items returned to his family with the rest of his personal effects.[47]

Figure 8: Private Nicholson's Watch

These short accounts demonstrate how the physical presenting of a gift, an object, to a departing soldier manifested the bonds that existed

[45] "Presentation Wristwatch: Private R. B. Cameron, 25 Battalion, AIF." Australian War Memorial. Accessed November 23, 2020. https://www.awm.gov.au/collection/C114196?image=1.
[46] "Presentation Wristwatch: Private George Holmes Fleming, 57 Battalion, AIF," Australian War Memorial, accessed November 23, 2020, https://www.awm.gov.au/collection/C1214265?image=2.
[47] "Wristwatch with Mesh Guard: Private A M Nicholson, 5 Battalion AIF," Australian War Memorial, accessed November 23, 2020, https://www.awm.gov.au/collection/C1227003?image=1.

between the soldier and his family, and the soldier and his community. To understand the trench watch solely as a practical tool, as another piece of gear defined by the front, is to uncharitably sever the relationship that soldiers had with it. As we have seen, watches were gifted by lovers, troops that one served with and any number of other relationships. That they doubled as a practical gift explains their popularity, but there is much more occurring than merely equipping the soldier. Indeed, the transformation of the watch into a sacred object occurred while both alive and dead among the men on the front. Robert Hale saw his wristwatch as a constant reminder of his beloved Alice, a rare countervailing force amidst the bloodshed he witnessed at the front. Similarly, Private Cameron's mother sought the watch she had gifted her son to solidify her memory of him. The transformation from practical to sacred objects is important when considering both the psychological state of men at the front, and also the state that those at home felt upon learning of their loved one's death. In Private Nicholson's case, his family did not receive his body back, thus making the receipt of an item he would have worn daily that much more precious as a token of remembrance.

Chapter Three: Wartime

The outbreak of the First World War on the 28th of July 1914 led to major innovation across disciplinary boundaries concerning time. As we have seen, the development of a timekeeping society set the stage for the modern understanding of time as being defined by the clock. The war acted as an accelerant for pre-existing trends such as the wear of the wristwatch by men, but it also allowed for and created new situations where the manipulation of time as a broader concept was used for strategic purposes. This conceptual realignment is epitomized by the development of "wartime".

The idea of "wartime" achieved an unheralded reality during the First World War. Previous wars had occurred without the vast reorientation of society toward production that the new phenomenon of total war demanded. Thus, for the first time, "wartime" as a discrete concept crystallized.[49] "Wartime" hearkened back to an earlier era. While the "clock time" of Einstein replaced the "psychological time" of Bergson, both of those concepts had at root the idea of an individual who was the subject of time and had a differing phenomenological relation to it. As "wartime" developed into its fullest expression, those individual times were subjugated to the greater goal of productivity and state ends; Kern writes that the war demanded "…coordination of all activity according to a single public time."[50] This return to the "public time" of the early 19th century was a reversal from the change wrought by the industrial revolution and its readjustment of the temporal rhythms of daily life to encourage private time. As warring states implemented Daylight Saving Time to preserve energy, the public clock triumphed over the personal, marking a return to an era when time distribution had been the domain of public facing

[49] Mary Dudziak, *War Time: an Idea, Its History, Its Consequences* (New York, NY: Oxford University Press, 2012), 3.
[50] Kern, 288.

buildings such as clock towers and time balls, or marked by public signals such as the ringing of bells. The individual sense of time of Bergson and Proust was eliminated to inspire unification of purpose. When combat began however, that time had not yet been eliminated by the mass efforts of coordination that would lead to the totalization of war. When the armies started their mad dash for a quick victory, time and speed were vital to the plans of the powers involved.

One of the first cases where time was of the essence regarding combat on the Western front was mobilization. Before conflict could occur, every major combatant had detailed plans drawn up about how to move their armies to mustering locations as quickly as mass transportation permitted. This concern with time had important diplomatic implications as well. During the July Crisis, the series of events following the assassination of Austro-Hungarian Archduke Franz Ferdinand on 28 July 1914, constant reference was made to the speed of mobilization. As diplomatic efforts to halt the growing conflict failed and the triggering of alliances that pitted nation against nation were invoked, two nations stand out for their mobilization plans and the effects of time on those plans.

In the first instance, German mobilization plans were tied to an extremely strict timetable. The Schlieffen Plan, as originally conceived by Chief of the General staff Alfred von Schlieffen, took the form of a decisive German blow against France. The strategic goals of this plan were threefold; to ensure a short war, to prevent economic disarray, and to avoid a two-front war with Russia. The first goal is what interests us most in this paper. To achieve this goal, Germany relied on its rail network. German use of railroads to mobilize troops had a distinguished history, dating back to the elder von Moltke's use of rail-power to decisively defeat France and unify Germany in the 1870-71 Franco-Prussian War. Indeed, such was the importance of this issue to German military planners that von Moltke in his last speech to the Reichstag on 16 March 1891

urged an adoption of standard time saying "it is of great importance that the existence of all these different railway times, to which must be added all the local times, seriously increases the difficulty of railway management, (and that it does so more especially at times when military exigencies cause increased demands to be made on the railways.)[51] Following the recommendation of its strategic grandmaster, Germany set time by Berlin starting on 1 April 1893. This change is important in that it reflects the social dynamics of changing the time. While von Moltke was advocating for the time change along lines of military necessity, he was far from unconscious of the unifying effect that the introduction of standard time would have for the nascent German state. All of these efforts culminated in the rapid German advance on 6 August 1914. The armor theorist B.H. Liddel Hart postulated that the Germans were partly responsible for the failure of their assault, as their advance was so rapid that they outpaced their supply train.[52] The lessons of previous wars and the vital importance of rail were taken to the extreme by the Germans, such an extreme that it contributed to the collapse of their assault at the First Battle of the Marne.

In the second case, that of Russia, their plans were also tied to a strict timetable. This was necessitated by the vast distances that Russian troops had to cross to reach the Western front. This movement was complicated by reforms initiated after the Russian loss to Japan in 1905 and a reorganization that led to the majority of Russian forces being massed in the interior of the country.[53] In order to deploy forces quickly, the Russian Empire had developed a plan allowing for a period prior to actual mobilization in which steps were taken to ease the logistical burden of

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[51] Helmuth Moltke et al., *Essays, Speeches, and Memoirs of Field-Marshal Count Helmuth Von Moltke* (New York: Harper & Bros., 1893), 40.
[52] Basil Liddell Hart, *The Real War* (London: Faber & Faber Limited, 1930), 69. https://archive.org/details/in.ernet.dli.2015.57906/mode/1up?q=ahead.
[53] Evgenii Sergeey, "Pre-War Military Planning (Russian Empire)" in*: 1914-1918-Online. International Encyclopedia of the First World War* (Freie Universität Berlin, 2014), DOI: 10.15463/ie1418.10451.

moving its vast army. This liminal time, prescribed by the Regulation on the Preparatory (Pre-Mobilization) Period, greased the tracks for the partial mobilization using schedule nineteen that occurred on the 25th of July 1914. Improvements in Russia's western railroads, while marked in comparison to what had existed previously, were still far from adequate for the swift blow against Austria that Russia planned to make while Germany was occupied with France.[54] Shockingly however, the Russians defied German expectations of a six week mobilization period and deployed an army in just fifteen days. While failures of generalship led to the destruction of the Second Russian Army and loss of momentum by the First Army, the fact that the Russians were able to operationalize the pre-war planning they had done is laudable.

Germany instituted Daylight Savings Time on the 30th of April 1916. Michael Downing tells us that the London *Times* had this to say in May of that year "the change required no legislation, but was merely 'ordained' by the Federal Council in the exercise of powers which it enjoys during the war."[55] This mobilization of time by the government is an example of the new demands that the modern warfare of the First World War inaugurated. No longer was warfare confined to the battlefield. The expansion of the area of conflict to the Homefront, indeed, the very word "Homefront" reflects this monumental change. The manipulation of time was just one of a series of efforts to adapt the population to the demands of warfare, in the case of Daylight Saving Time, to save coal to preserve energy. This manipulation of time did not just occur in the warring states. Just as France had attempted to maintain its own time out of a sense of national pride when Greenwich was initially established as the prime meridian, Germany took the

[54] L. C. F. Turner, "The Russian Mobilization in 1914," *Journal of Contemporary History* 3, no. 1 (1968), 69. http://www.jstor.org/stable/259967.
[55] Michael Downing, *Spring Forward: The Annual Madness of Daylight Saving Time* (Washington, D.C.: Shoemaker & Hoard, 2005), 6.

opportunity to realign its occupied territories with its own time. In Belgium, the time from 1900-1913 had been unchanged, in 1914 it shifted to Central European Time, the same time zone as Berlin. It would not return to Western European Time until November 11th, 1918 at 12:00PM.[56]

A well-studied field of the First World War is that of the development of propaganda to motivate the populace to achieve specific goals. In a similar way, Daylight Saving Time represented an attempt by the state to achieve uniformity by appeal to national sentiments and aid the war effort. This attempt to reorient the rhythms of daily life was a truly radical project at the beginning of the war and was an essential component of the development of the "total war" concept. Indeed, many people's experience of the war was defined by finding ways to break the cycle of imposed time that the state prescribed. The homogenizing effects of the state policies designed to forge unity of purpose and action also acted to dehumanize their subjects.

The effects of wartime were acutely felt amongst the civilian populace. Vera Brittain, an educated woman and nurse in wartime England remembered that "the very detachment of women from the most direct forms of active service impressed on me once and for all the domination by war between 1914 and 1919 of even the most trivial aspects of everyday life."[57] The militarization of the domestic sphere and the role of the state in tying the civilian population to the war effort by directing labor, creating propaganda and centralizing resources is well-studied by scholars such as Susan Grayzel. It comes as no surprise that those efforts would deeply affect the temporal perception of the civilian population. Brittain mentions that her brother was serving on the Italian front before being killed and the gap between sending a letter

[56] "Time Zone in Brussels, Belgium in 1914," timeanddate.com, November 24, 2020, https://www.timeanddate.com/time/zone/belgium/brussels?year=1914.
[57] George A. Panichas, *Promise of Greatness: the War of 1914-1918* (New York: John Day Co., 1968), 373.

and receiving one back was excruciating, as in that span "the writers… would have had time to die many times."[58] If the pain was so great for her, comparatively close to the front, we can only imagine the anxiety and strain felt by citizens of Britain's far-flung possessions in Australia and Canada. Just as soldiers on the front experienced temporal disruption via unnatural laconic periods between offensives, punctuated by the shocking violence of the assault, so too did the Homefront. The extension of wartime was absolute, as families at home could follow offensive via the news faster than ever before, thus expanding the timelines of the battlefield into their very homes. Brittain tells us that before the great assaults "The striking of a clock, marking off each hour of dread, broke into the immobility of tension with the shattering effects of a thunderclap."[59] This account demonstrates that the psychological toll taken on the Homefront is not to be discounted. The increased speed of communication altered the experience of wartime by enhancing awareness of the conflict to an unprecedented degree.

Soldier's Experience

Soldiers on the front had no choice in the "when" of their lives. While this had been the case in previous wars as well, the proximity of the enemy on the Western Front, often only a few hundred yards away across a blasted landscape of barbed wire and shell craters, coupled with the vastly increased range of artillery weapons, meant that shocking violence could occur at any time. The precariousness and unpredictability of the situation meant that the psychological burden on soldiers was immense.

On the actual front lines of battle, soldiers used the language of time in concert with vivid descriptions to emphasize the difficulty and horrors of battle. An account from George Adkins

[58] Ibid, 374.
[59] Ibid.

dated 5 June 1916 is replete with references to the time over eight days of combat. He wrote to his mother that "It has been simply awful I cannot describe it in words but I know there has been nothing worse in this war… we had another awful 24 hrs during which they sent over the terrible high explosives & shrapnel… I was hit on the head about four times but my steel helmet saved me. Then I had a bullet go right through a mess tin strapped on my back…. We had to stay in that trench for 8 hours without water & no food but about two dry biscuits each."[60] This letter is notable for the way in which Adkins ties the visceral horrors of combat to a temporal frame. He repeatedly mentions the time to emphasize the length of what he was forced through. Given such reports from the front, it is no wonder that the civilian population found it difficult to isolate their concerns about family and friends, as there was no refuge for the presence of the war. Gender played an important role in separating the type of work one did during the conflict, but wartime in the modern era of total war transcended the boundaries that had traditionally isolated families from the battlefield. Most of the primary sources used in this chapter are from letters, Henri Barbusse describes the temporary escape that sending a letter provided "…in his 1916 novel *Le feu* … 'letter-writing time is the moment when we are most and best what we were'."[61] This passage demonstrates the power of the transformative nature of wartime, the tension present between the soldier in the trench and his civilian life and attachments was broken open in liminal moments such as letter-writing. Between soldier and civilian was not the only dichotomy that the war changed.

While speed and time had always been important on the tactical level of the prior era to seizure good terrain and maneuver vigorously, the increased importance of timing for strategic

[60] George Adkins n.d.
[61] Henri Barbusse, *Under Fire: The Story of a Squad* (Groupe Flammarion, 1916), 40.

purposes was brought about by the First World War. The sheer size of the armies in play necessitated this shift. Time and timekeeping were essential for the conduct of military operations on the modern battlefield. Synchronization became an important goal of modern warfare and the combined arms approach demonstrated by the development of the iconic "creeping barrage" was entirely dependent on accurate timekeeping. That this was the case was the result of the incorporation of vast amounts of new technology into the warfighting sphere. New and more powerful artillery, grenades, flamethrowers, repeating rifles and more altered the tactical level of war such as to make it unrecognizable to those who only a few decades earlier had relied on the cavalry charge and the esprit de corps of their soldiers to carry the day. This wave of modernization led to strategic level shifts as well as commanders conceptualized new strategies for breaking the stalemate that had set in after the armies in the West had entrenched themselves in 1915.

The First World War saw the maturation of massed fires of artillery into a truly devastating method of warfare. By 1917, the armies of the Western front had mastered indirect fire at ranges of 5-9,000 yards, this increase in range allowed for the "creeping barrage" to break the defensive stalemate.[62] The importance of this method cannot be overstated. Different variations to "thicken" the barrage and alter its timing gave commanders the ability to shape the battlefield in meaningful ways. This was demonstrated in 1917 as British artillery tactics were changed to destroy the concrete pillboxes of the Germans and again in 1918 as the barrage obviated enemy machine gun fire.[63]

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[62] Kern, 308.
[63] Robin Prior, "The Western Front," in *The Cambridge History of the First World War*, ed. Jay Winter (Cambridge: Cambridge University Press, 2014), 222-229.

Paddy Griffith tells us that matters of time were of the utmost importance in ensuring the success of this tactic. A primary consideration was calculating the rate of advance, which he states varied depending on the conditions from a hundred yards every two minutes to the same distance in eight minutes. Another impact of time on the battlefield was discerning the best period for "zero hour", the moment of attack. Griffith tells us that while initially the dead of night was favored, "mid-morning or mid-afternoon could also sometimes prove to be even more surprising to routine-bound trench-dwellers…"[64] Perhaps one of the most surprising uses of time in artillery operations was its employment in counterbattery techniques. A great advantage was gained if one was able to locate the enemy guns and destroy them. One of the technological breakthroughs of the war was "sound-ranging", this technique used microphones to record the sound of an enemy gun firing, Griffith tells us that a "…microphone's signal was then translated into a movement of a wire inside a galvanometer, which was in turn recorded on cine film to show a differentiation in time that was accurate to one hundredth of a second. By comparing the time difference… the location of the enemy gun could finally be determined… to within twenty-five yards."[65] The Germans failed to master this technology over the course of the war, and the British edge in "sound-ranging" coupled with advanced aerial photography allowed them to rain accurate counterbattery fire down on the Germans until the Armistice. Technology was not the only part of war that took newfound note of time.

Time was vital to the soldier experience in the psychological realm as well. Kern writes that the distinction between day and night began to bleed as the advantage of darkness shifted the diurnal rhythms of soldiers toward the hours of night. Cecil Lewis in his post-war novel

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[64] Paddy Griffith, *Battle Tactics of the Western Front: the British Army's Art of Attack, 1916-18* (New Haven, CT: Yale University Press, 2000), 145.
[65] Kern, 154.

Sagittarius Rising wrote that "By day the roads were deserted; but as soon as dusk fell they were thick with transport, guns, ammunition trains, and troops…Endlessly, night after night it went on…Never do I remember a time when night so contradicted day."[66] Kern tells us that the hour of "stand to", the hour preceding the beginning of morning activities such a shaving and attending to one's kit, was marked by particular tension, as every soldier for hundreds of miles along the front was aware that his enemy was just across the pitted expanse of no man's land, alert, waiting for an attack or a hint of the enemy peering over the top of the opposing trench.

Aside from small-scale attacks, the "zero hour" of large offensives was often placed in the hours of darkness to provide some cover for the advancing infantry. An example of this tactic was the Third Battle of Ypres, the British zero hour was set at 0350 to thwart the observation capabilities of the Germans. Many men who may have been in possession of a pre-war watch were able to have it modified to bear luminous paint. A 1915 advertisement by the Waltham Watch Company in the British magazine *Land & Water* states that "For a small extra charge a luminous dial may be fitted to this wristlet watch and you can then read the time on the darkest night. No need to strike a match…"[67] This advertisement is revealing in its reference to the striking of a match; to take the British as an example, a dedicated sniper platoon was attached to each battalion, scanning the lines for an opportunity to pick off an unwitting enemy. A sentry striking a match in the black hours of the morning to read his watch made himself an appealing target. While sniping played a limited role in the offensives of the First World War, being mainly a static activity of the defense, its dangers and space in the minds of soldiers should not be discounted.

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[66] Cecil Lewis, *Sagittarius Rising* (Rahway, N.J.: Quinn & Boden company, 1936), 76-77.
[67] Hilaire Belloc and Frederick Jane (London: Country Gentleman Pub. Co, 1915), 71. https://archive.org/details/landwater00hilauoft/page/n71/mode/2up?q=no+need+to+strike+a+match.

Private William Bell of the 151st Overseas Battalion of the Canadian Expeditionary Force wrote to his brother on 4 February 1917 that "the night are about 30 hour long in the front line and about 3 when you are sleeping as far as the hun are consert I don't mind them much as he stay in his on trench and I can keep my head low enough so his old sniper cant get an aim on my bean cause they never miss…"[68] His description of the nights varying in length demonstrates the constant weight of danger that hung over the heads of every man on the front.

The wave of innovation precipitated by the outbreak of war led to a new vocabulary being developed as well as revealing the shortfalls of existing language. To address the latter point, while historians refer to the battles of the Great War as discrete, interpretable entities, this is misleading. The prime example of this is the "Battle of Verdun". This "battle" stretches the use of the term to its utmost lasting from the 21st of February to the 18th of December 1916, just a little under a year. John Keegan addresses this issue writing that "Battles, or more precisely defeats, are immediately decisive because they kill some of these men and dissuade the rest, for a longer or shorter period, from wanting to fight anymore."[79] The very lack of decisiveness led to the "abolition of battle" as a useful concept. This lack of coherence is even more striking when contrasted with the necessity on a tactical level of clear, precise timing in orders as discussed below.

The phrase "synchronize your watches" stems from the First World War. An operations order from the First Battalion of the Bedfordshire Regiment from 16 March 1918 that outlines the procedures for moving the battalion to billets states that "Watches will be synchronised with

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[68] William Bell, accessed November 14, 2020, https://www.canadianletters.ca/content/document-492?position=8&list=6B6YOh0F0yZA-MFKuH-brFILENxdLxehoYn_imEi-ac.
[79] John Keegan, *The Face of Battle: a Study of Agincourt, Waterloo and the Somme* (London: The Bodley Head, 2014), 335. https://archive.org/details/faceofbattl00keeg/page/335/mode/1up?q=abolition.

the Adjutant at 9 a.m. on the 18th"[80] That this step was incorporated into simple non-combat operations such as unit movement testifies to the importance of time discipline amongst personnel. Kern writes of the Battle of the Somme and other mass offensives "…hundreds of platoon leaders blew their whistles when their synchronized watches showed that it was 7:30 AM.... The delicate sensitivity to private time of Bergson and Proust was obliterated by the overwhelming force of mass movements that regimented the lives of millions of men by the public time of clocks and wristwatches, synchronized to maximize the effectiveness of bombardments and offensives."[81] This was the war, this was the way that time changed conflict. It enabled unprecedented destruction and loss of life by allowing for coordination beyond what could have been imagined only a few decades prior. Such was its effect that English changed to reflect the newfound importance of this temporal paradigm.

The time also played an important role in the Armistice. As the agreement came into effect at 11 AM Paris time, senseless death occurred up to an hour before that time. A prime example is the American 26th Division under the command of the French II Colonial Corps. On the morning of the eleventh they had received word that the war was to end at 11:00 AM, accordingly a scheduled attack had been cancelled. The attack was then re-scheduled for 10:30. That final half hour of needless death epitomizes the tragedy of wartime. This fact was not lost on the soldiers, of all ranks save the very highest. This is reflected in the official US Army history of the Meuse Argonne Campaign, which states that "The death of American soldiers in the waning hours of the war was tragic. Pershing, however, deemed these losses to be a sad

[80]"OPERATION ORDER No. 128. 1st. Battalion The Bedfordshire Regiment. Reference Map - BRENTA PIAVE, 1/100,000. March 16th. 1918.," 1st Bn 1918 War Diary appendices (Steven Fuller), accessed October 26, 2020, http://www.bedfordregiment.org.uk/1stbn/1stbtn1918appendices.html.
[81] Kern, 288.

necessity of war. Both he and Foch maintained that the Armistice on 11 November was merely a cessation of fighting and not a formal end to the conflict."[82] The loss of lives became a matter of post-war consternation among the American public, such that General Pershing, the lauded war-hero of the American Expeditionary Force, was summoned before Congress on 5 November 1919 to answer questions. It is important to emphasize that the number of soldiers that died on the last day of the war totaled "nearly 11,000 casualties, dead, missing and injured, exceeding those on D-Day in 1944. Over 3,500 of these were American."[83] This was no accidental loss of life. The "false standard of excellence of divisions according to the amount of ground gained by each division"[84] as described by Brigadier General John Sherburne in post-war testimony before the House Committee on Military Affairs led to a loss of life that was even more devoid of meaning that the senseless slaughter in the great battles of Verdun and the Somme. In the waning moments of the war, soldiers did not even die for inches of ground, they were sacrificed at the altar of wartime, ensuring that even the final minutes would be stained with bloodshed.

The transition from "wartime" to peacetime was not smooth. Indeed, it is widely accepted that the seeds of the Second World War lie in the punishing terms of the Treaty of Versailles; one of the many flaws of that treaty was a refusal to allow Germany to enter peacetime. By infamously forcing Germany to accept total blame for the start of the war, the national consciousness of the new Weimar Republic was bound to the legacy of defeat. Added to that was humiliation, as France occupied the Rhineland and demanded reparations and the myth of the "undefeated army" spread. The inchoate state had little chance of success under such conditions.

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[82] Richard Shawn Faulkner, *Meuse-Argonne 26 September-11 November 1918* (Washington, D.C.: Center of Military History, United States Army, 2018), 70. https://history.army.mil/.
[83] Tara Finn, "The war that did not end at 11am on 11 November" *History of Government* (blog), November 9, 2018, https://history.blog.gov.uk/.
[84] Joseph E. Persico, "Nov. 11, 1918: Wasted Lives on Armistice Day," *Army Times*, November 9, 2017, https://www.armytimes.com/veterans/salute-veterans/2017/11/10/nov-11-1918-wasted-lives-on-armistice-day/.

The formation of Freikorps units at the end of the war also testifies to the inability of German soldiers to accept the end of wartime. As the Empire collapsed, they clung to the military structure that had governed their lives for the previous four years. Their desire to continue to be governed by the public clock and inability to regain private time is an effect as traumatic as any wound. Wartime defined these men and the new German nation and that fact flowered into dark activity with the appointment of Hitler as Chancellor in 1933.

Conclusion

The study of time and its effect on the fundamental activity of the human experience is a vast subject. I hope here to have demonstrated its importance to a number of small but important fields of history. I attempted to show the effects of this force via the history of objects and technology as embodied in the trench watch. Time of course does not exist in isolation, so I touched upon the role of women in the workplace and how their formerly exclusive domain of the "wristlet" was changed as a result of conflict and how they experienced wartime. There is still a great amount of work to be done on the role of women in making watches, in experiencing wartime, and in driving consumer trends. I would love to see those topics explored. Similarly, the history of sport and its influence on the development of the wristwatch deserves attention. There were so many new trends, from aviation to automobiles, that touch and inspire the wristwatch and changing notions of time around the turn of the century that an exhaustive study would still not encapsulate all of them. What those trends produced though, when taken to their conclusion, was the carnage of the First World War. The development of "wartime", the Homefront, and total war marked a new era in human history, one in which we are still feeling the ramifications a little over a hundred years later.

The change brought by the war extended into the very rhythms of daily life as trench warfare and the pattern of combat led to a life in which "At the front, time stopped for violence to pass, and the alternating periods of violence and stillness, of savage bombardments followed

by sudden silence, blended to render time dimensionless, indistinct."[85] The unnatural passing of time was an effect of the dehumanizing processes of the totalization of war. Leed quotes Carl Zuckmayer on war: "One had to undergo the hardest things, so difficult to endure in the following years at the front: the monstrous boredom, the exhaustion, the unheroic, mechanical day-today of war in which terror, fear and death were inserted like the striking of a time-clock in an endless industrial process."[86] There was no chance to reflect or to pause. The adoption of the wristwatch and its increasing commonality across all ranks of the opposing armies was an attempt by the soldier to reclaim a sliver of control over a fundamental force that governed his life. Being able to recall the activities of peacetime that would occur around a certain hour was made all the easier by knowing the hour. The epistemic aspect of possession of a timepiece is perhaps the most important part of the function of the wristwatch for a soldier on the front.

Cartier's "Tank" watch is perhaps the clearest example of a product designed to appeal to the veteran's experience of the latter half of the First World War. Of the many military inventions that the war introduced one of the most iconic was the tank. As tanks became more reliable and doctrine related to their effective employment became more sophisticated, by the 1917 Battle of Cambrai "…tanks were a critical component of a combined arms assault involving infantry and artillery, which successfully drove a salient eight kilometers deep into enemy territory while suffering a fraction of the typical casualties."[87] This transformation from a useless and unreliable hulk to the "land battleship" that had been initially envisioned made the tank a marketable object. To that end, Cartier's "Tank" watch was based off of the profile of the

[85] Panichas, *Problem of Greatness*, xxi.
[86] Eric J. Leed, *No Man's Land* (Binghamton, NY: Cambridge University Press, 1979).
[87] Michael David Kennedy, "Tanks and Tank Warfare" in *1914-1918-Online. International Encyclopedia of the First World War*, ed. Ute Daniel et al. (Freie Universität Berlin, 2016), https://encyclopedia.1914-1918-online.net/article/tanks_and_tank_warfare.

tank as seen from above, the resulting rectangular shape was highly distinctive compared to the circular designs that dominated the industry. The invention of this watch was a watershed moment in horological history. The era of the pocket watch had been put firmly into the past. Millions now wore wristwatches. The "Tank" anticipated the radical new designs of the coming decade, as watchmakers were no longer bound to the circular case shape that had so long dominated the industry.

After the conclusion of the war, interest in sports and their military association endured, one of the most innovative watch designs of the 1930s took advantage of new design space that the war had created, Cartier's "Tank" watch being the archetypal example. As Glasmeier indicated, the rise of sports as a recreational activity demanded a more robust timepiece. To that end, Jaeger Lecoultre patented the "Reverso" in 1931. The idea for the watch was apocryphally brought about by a polo match amongst British Army officers in India in which a player had broken his watch. In the absence of a strong material like the sapphire crystal that fine watches have today, the "Reverso" solved the durability problem by turning the watch face inward during sport. That innovation, coupled with the rectangular art deco design of the watch, made it a huge hit as it fit the spirit of the day. In this model we can see how the social mores around watches had changed as a result of the war. Rectangular designs were now possible, inspired by the "Tank", and men wore wristwatches during casual activities such as sports. This extension of time-awareness to leisure activities was another effect of the war, as men who played soccer at the front or other games in the rear were constantly aware that the moment could end in shellfire or recall to an offensive.

Other changes were less direct than the clear line that can be drawn from the battlefield to the "Tank" watch. The ideas of "wartime" and the "Homefront" had come into being and would

be an essential part of the next great war. The totalization of war led to a new state of being, one in which the individual was subsumed into the vast industrial and administrative processes that the state directed. Even post-war, states experimented with the implementation of Daylight Saving Time, meddling with time in ways that had previously been reserved for exigent circumstances. This ontological change continued with devastating effect in Germany, as discussed in the end of Chapter Three. Aside from politics, art was also transformed by the legacy of the Great War. No longer could a nation ignore the harsh reality that it was at war, the battlefield was everywhere. This loss of innocence is reflected in the post-war culture. From literary masterworks such as Hemingway's *A Farewell to Arms* to art such as that produced by Otto Dix in his nightmarish *Der Krieg*, the war's effect on the "Lost Generation" cannot be understated.

The study of the soldier experience helps us to understand more fully the trauma of the human condition. The wristwatch and its effect on changing the dominant view of time is an important story, one that I am happy to have told in some small way. Too many of the ubiquitous objects of modern life go uninterrogated. I look forward to more scholarship on the cultural history of time, the sociological impact of the wristwatch and the effects on state power of wartime.

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